

CLAIMS

1. A picture coding method of coding a plurality of pictures included in a picture signal for generating a coded picture signal in the following manner: coding each of predetermined pictures as an entry picture without reference to another picture; and coding each of the pictures other than the entry pictures with reference to another coded picture,

wherein the picture signal is processed per access unit which is made up of a plurality of pictures including the entry picture, and

the method comprises:

a first reference restriction step of restricting, in a target access unit to be processed, so that a post-entry picture located after the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in coding order; and a pre-entry picture which is located before the entry picture in display order and refers to a picture located before the entry picture in coding order; and

a second reference restriction step of restricting, in an access unit immediately following the target access unit, so that a pre-entry picture located before the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in the target access unit in coding order; and a pre-entry picture in the target access unit, which refers to a picture located before the entry picture in the first access unit in coding order.

2. The picture coding method according to Claim 1,

wherein in the first reference restriction step, another picture is used for reference except for the following pictures: a picture located before the entry picture in coding order; and a pre-entry picture located before the entry picture in display order, and

in the second reference restriction step, another picture is used for reference except for the following pictures: a picture located before the entry picture in the target access unit in coding order; and a pre-entry picture in the target access unit.

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3. The picture coding method according to Claim 2, further comprising

a selection step of selecting the target access unit.

10 4. The picture coding method according to Claim 3, further comprising:

a reference structure information coding step of coding reference structure information indicating an access unit processed as a target access unit for which the first and second
15 reference restriction steps have been executed; and

an insertion step of inserting the coded reference structure information into the coded picture signal.

20 5. The picture coding method according to Claim 3, further comprising:

a reference structure information coding step of coding, per access unit, each reference structure information indicating whether or not the first and second reference restriction steps have been executed for each access unit processed as a target access
25 unit; and

an insertion step of inserting each reference structure information corresponding to each access unit into said each access unit included in the coded picture signal.

30 6. The picture coding method according to Claim 3, further comprising:

a reference structure information generation step of

generating each reference structure information indicating whether or not the first and second reference restriction steps have been executed for each access unit processed as a target access unit; and

5 a reference structure information output step of outputting the reference structure information generated in the reference structure information generation step, by attaching the generated information to the coded picture signal.

10 7. The picture coding method according to Claim 6, further comprising

 a coding/insertion step of coding each identification information for identifying each reference structure information corresponding to each access unit, and inserting said identification
15 information into said each access unit included in the coded picture signal.

8. The picture coding method according to Claim 3, further comprising:

20 a reference structure information coding step of coding, per access unit, each reference structure information indicating a range of reference for each picture included in each access unit; and

 an insertion step of inserting each reference structure
25 information corresponding to each access unit into said each access unit included in the coded picture signal.

9. The picture coding method according to Claim 3, further comprising:

30 a reference structure coding step of coding, per access unit, each reference structure information indicating a range of reference for each post-entry picture included in each access unit,

and a range of reference for each pre-entry picture included in an access unit immediately following said each access unit; and

an insertion step of inserting said reference structure information corresponding to each access unit into said each
5 access unit included in the coded picture signal.

10. A coded picture signal generated using a picture coding method of coding a plurality of pictures included in a picture signal in the following manner: coding each of predetermined pictures as
10 an entry picture without reference to another picture; and coding each of the pictures other than the entry pictures with reference to another coded picture,

wherein the picture coding method comprises:

a first reference restriction step of restricting, in a target
15 access unit to be processed, so that a post-entry picture located after the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in coding order; and a pre-entry picture which is located before the entry picture in display order and refers to a picture
20 located before the entry picture in coding order; and

a second reference restriction step of restricting, in an access unit immediately following the target access unit, so that a pre-entry picture located before the entry picture in display order refers to another picture except for the following pictures: a
25 picture located before the entry picture in the target access unit in coding order; and a pre-entry picture included in the target access unit, which refers to a picture located before the entry picture in the target access unit in coding order.

30 11. The coded picture signal according to Claim 10,
wherein the coded picture signal includes reference structure information indicating an access unit processed as a

target access unit for which the first and second reference restriction steps have been executed.

12. The coded picture signal according to Claim 10,
5 wherein the coded picture signal includes, in each access unit, reference structure information indicating whether or not the first and second reference restriction steps have been executed for each access unit processed as a target access unit.

10 13. The coded picture signal according to Claim 10,
wherein the coded picture signal includes, in each access unit, identification information for identifying each reference structure information indicating whether or not the first and second reference restriction steps have been executed for each
15 access unit processed as a target access unit.

14. The coded picture signal according to Claim 10,
wherein the coded picture signal includes, in each access unit, reference structure information indicating a range of
20 reference for each picture included in said each access unit.

15. The coded picture signal according to Claim 10,
wherein the coded picture signal includes, in each access unit, reference structure information indicating a range of
25 reference for each post-entry picture included in said each access unit and a range of reference for each pre-entry picture included in an access unit immediately following said each access unit.

16. A program for coding a plurality of pictures included in a
30 picture signal for generating a coded picture signal in the following manner: coding each of predetermined pictures as an entry picture without reference to another picture; and coding each of the

pictures other than the entry pictures with reference to another coded picture,

wherein the picture signal is processed per access unit which is made up of a plurality of pictures including the entry picture, and

5 the program causes a computer to execute the following:

a first reference restriction step of restricting, in a target access unit to be processed, so that a post-entry picture located after the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in coding order; and a pre-entry picture which is located before the entry picture in display order and refers to a picture located before the entry picture in coding order; and

a second reference restriction step of restricting, in an access unit immediately following the target access unit, so that a pre-entry picture located before the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in the target access unit in coding order; and a pre-entry picture included in the target access unit, which refers to a picture located before the entry picture in the target access unit in coding order.

17. A recording medium storing a program for coding a plurality of pictures included in a picture signal for generating a coded picture signal in the following manner: coding each of predetermined pictures as an entry picture without reference to another picture; and coding each of the pictures other than the entry pictures with reference to another coded picture,

wherein in the program, the picture signal is processed per access unit which is made up of a plurality of pictures including the entry picture, and

the recording medium causes a computer to execute the following:

a first reference restriction step of restricting, in a target access unit to be processed, so that a post-entry picture located after the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in coding order; and a pre-entry picture which is located before the entry picture in display order and refers to a picture located before the entry picture in coding order; and

a second reference restriction step of restricting, in an access unit immediately following the target access unit, so that a pre-entry picture located before the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in the target access unit in coding order; and a pre-entry picture included in the target access unit, which refers to a picture located before the entry picture in the target access unit in coding order.

18. A picture coding apparatus for coding a plurality of pictures included in a picture signal for generating a coded picture signal in the following manner: coding each of predetermined pictures as an entry picture without reference to another picture; and coding each of the pictures other than the entry pictures with reference to another coded picture,

wherein the picture signal is processed per access unit which is made up of a plurality of pictures including the entry picture, and the apparatus comprises:

a first reference restriction unit operable to restrict, in a target access unit to be processed, so that a post-entry picture located after the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in coding order; and a pre-entry picture which is located before the entry picture in display order and refers to a picture located before the entry picture in coding order; and

a second reference restriction unit operable to restrict, in an access unit immediately following the target access unit, so that a pre-entry picture located before the entry picture in display order refers to another picture except for the following pictures: a picture located before the entry picture in the target access unit in coding order; and a pre-entry picture included in the target access unit, which refers to a picture located before the entry picture in the target access unit in coding order.

- 10 19. The picture coding apparatus according to Claim 18,
wherein the first reference restriction unit refers to another picture except for the following pictures: a picture located before the entry picture in coding order; and a pre-entry picture located before the entry picture in display order, and
- 15 the second reference restriction unit refers to another picture except for the following pictures: a picture located before the entry picture in the target access unit in coding order; and a pre-entry picture in the target access unit.